Abstract Submitted
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A Measurement of Neutron Polarization Asymmetries in Photofission of $^{235,238}U$ Using Polarized Gamma Rays at HIγS[1] J.M. MUELLER, M.W. AHMED, S.S. HENSHAW, H.J. KARWOWSKI, L. MYERS, B.A. PERDUE, S. STAVE, J.R. TOMPKINS, H.R. WELLER, Triangle Universities Nuclear Laboratory (TUNL), B. DAVIS, D. MARKOFF, North Carolina Central U. (NCCU) — A photofission experiment was performed on $^{235,238}U$ using nearly 100% linearly polarized, high intensity ($\sim 10^7 \gamma/s$), and nearly-monoenergetic gamma-ray beams of energies between 5.8 and 7.0 MeV at the High Intensity Gamma-ray Source (HIγS). An array of 18 liquid scintillating detectors, located at $55, 72, 90, 107, 125, 142^\circ$ in theta and $0, 90, 180, 270^\circ$ in phi, was used to measure prompt neutron angular distributions. The ratio of prompt neutron yields parallel to the plane of beam polarization to the yields perpendicular to this plane was measured as a function of beam and neutron energies. A ratio of unity was found for ^{235}U while a significant ratio (~ 3) was found for ^{238}U. A phenomenological model of near threshold photofission is being developed in an attempt to explain this large difference for these two isotopes. A simulation, based on our model and using previous measurements of fission fragment angular distributions, is being used to interpret our experimental findings.

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